



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/749,843      | 12/31/2003  | Seung Jong Yoo       | OG03-042            | 9453             |

36872 7590 09/02/2005

THE LAW OFFICES OF ANDREW D. FORTNEY, PH.D., P.C.  
7257 N. MAPLE AVENUE  
BLDG. D, SUITE 107  
FRESNO, CA 93720

EXAMINER

VINH, LAN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1765

DATE MAILED: 09/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/749,843

Applicant(s)

YOO, SEUNG JONG

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12704.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 2 Claims 1-2, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn (US 6,342,451) in view of Keller (US 5,968,844)

Ahn discloses a method of fabricating floating gates in semiconductor device. The method comprises the steps of:

forming a lower insulating layer 740 and a SiN layer 770/sacrificial layer on a semiconductor substrate 700 (col 6, lines 27-32)

patterning the layer 770/sacrificial layer and lower insulating layer, 740 wherein spacers 780 are formed on sidewalls of the SiN/sacrificial layer pattern 770 (col 6, lines 37-42)

etching/removing the exposed lower insulating layer to form lower insulating layer pattern (col 6, lines 55-57, fig. 5E)

removing the SiN/sacrificial layer pattern and the spacers (col 6, lines 61-65; fig. 5D)

Unlike the instant claimed invention as per claim 1, Ahn does not expressly disclose that the spacer 780 is formed of polymer resulting from the etching of SiN/sacrificial layer

Art Unit: 1765

Keller, in a method for etching nitride feature, discloses that dry etching a nitride feature deposits an amount of polymer on the sidewall of the nitride feature (col 4, lines 1-4).

Since Ahn is concerned with a step of anisotropically etching/dry etching the nitride layer (col 8, lines 39-40; fig. 5A), one skilled in the art at the time the invention was made would have found it obvious that Ahn step of etching the nitride layer would have formed polymer spacer on the sidewall of the nitride/sacrificial layer in view of Keller teaching because Keller discloses that the process chemistry, for performing an etch, is selected in order to deposit a desired amount of polymer on the sidewall of the nitride feature to be etched (col 4, lines 1-5)

The limitation of claim 2 has been discussed above

Regarding claim 4, Anh discloses method forming an upper oxide layer 760 with uniform thickness on the lower insulating layer pattern 740 and forming a gate polysilicon layer 750 on the insulating layer 740 (col 6, lines 25-30)

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn (US 6,342,451) in view of Keller (US 5,968,844) and further in view of Yu et al (US 5,801,083)

Ahn as modified by Keller has been described above. Unlike the instant claimed invention as per claim 3, Ahn and Keller fail to disclose that the polymeric spacer have a width between 300-1000 anstroms

Yu discloses a method for forming STI comprises the step of forming the polymeric spacer have a thickness/width between 200-500 angstroms (col 3, lines 27-29)

Art Unit: 1765

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Ahn and Keller method by forming the polymeric spacer have a width between 200-500 angstroms as per Yu because Yu discloses that polymer spacer formed on the side of opening 5a/sidewall of SiN layer 3 having a thickness between 200-500 angstroms (col 3, lines 27-30; fig. 2)

### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LV



August 30, 2005